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SYNOPSIS OF THE TACHINID FLIES OF THE GENUS
TACHINOMYIA, WITH DESCRIPTIONS OF NEW SPECIES

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THE genus *Tachinomyia* was erected by Townsend (1892, p. 96) for the reception of two new species, *robusta* and *floridensis*. He designated the former as genotype. Coquillett (1897, p. 118) considered the genus a synonym of *Tachina* (= *Exorista*), as also did Aldrich (1905, p. 469). According to Townsend (1908, p. 107), however, *Tachinomyia* "differs from *Tachina* in the vibrissae being inserted higher above oral margin, cheeks one-half eye height in width, and abdomen very elongate." Since these characters vary to some extent, more important, perhaps, is the structure of the genitalia, which, as pointed out by Curran (1926, p. 166), are entirely different from those of *Tachina*.

The writer wishes to acknowledge the assistance given him by the late Dr. J. M. Aldrich, who prior to 1926 made a study of the material at the United States National Museum and was prepared to recognize *Tachinomyia*, with new species included, but did not publish because of the appearance of Dr. C. H. Curran's paper (1926); to Miss Daphne Aubertin, of the Department of Entomology, British Museum, for the comparison of material with Walker's types; and to T. H. Jones for the use of material and notes of his making. Appreciation is expressed also to David G. Hall for his suggestions and advice. That which follows is the result of the writer's study of material at the United States National Museum, and at the laboratory of the Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, formerly maintained at

Melrose Highlands, Mass., while it was under the direction of C. W. Collins.

The characters employed by Curran, particularly those pertaining to the genitalia and sternites, appear to be the most satisfactory ones for the separation of the species. In order that they may be given careful study the specimen must be relaxed and the genitalia exposed. Unless this is done considerable doubt remains as to the formation of the anal forceps and the lobes of the fifth sternite. In *panaetius* and *apicata* the lobes are smooth distally, their inner edges ridgeless except at base, where they unite in an abrupt, upwardly rounded flange. While there is no basal flange in any of the other species, except possibly *floridensis*, some of them have the distal portion of each lobe furnished with a more or less conspicuous ridge along its inner edge. It is not clearly understood how much importance should be attached to this structure. Obviously it is subject to considerable variation within the species, as shown in the case of *cana* and *acosta*. However, in nearly all the specimens of *variata* that have been seen the ridges are well developed and provide a good character for identification. The form of the anal forceps is best determined by the aid of a crosshatched eye-piece micrometer, which will forestall any imaginary concept. An additional character is found in the lengthened villosity of the inner surface of the hind tibiae, and while applicable only in the case of *panaetius*, *floridensis*, and *apicata* (fig. 17, *g*), it is of constant occurrence and readily recognized.

The females are identified with difficulty. With a few exceptions the species, even in the males, appear more or less similar, and frequently their identity is doubtful. Since several of them occur simultaneously in the same region, association of sexes has but little value.

Little is known regarding the biology of the species. Townsend (1911, p. 141) tentatively placed *Tachinomyia* in his meigeniine series, species that glue a flattened macrotype egg to the body of the host. Several of the species have been occasionally bred from lepidopterous larvae, but records of rearing are rare in comparison to the field abundance of the flies, which are among the earliest vernal tachinids. Aldrich regarded *T. panaetius*, *sensu lato*, as one of the commonest North American species. In New England there is a single generation, the species passing the winter as puparia.

The generic characters of *Tachinomyia* are as follows: Eyes bare, although frequently thinly pilose in freshly emerged specimens; facial ridges bristly on at least the lowest third, usually about two-thirds way, but in no instance meeting the lowest frontals¹; ocellar

¹ *Allophorocera montana* Smith (1917, p. 140), which Aldrich (1927, p. 21) believed to be a *Tachinomyia*, can be excluded from the genus by this character as well as others.

bristles present, directed forward, no orbital bristles in male; antenna reaching lowest fourth of face, third segment at apex, outwardly truncate, inwardly rounded; second segment somewhat elongate, in female sometimes more than one-half length of third; arista bare, second segment short; frontal bristles extending below base of third antennal joint; front without evenly paired reclinate bristles outside of frontal row; no outer vertical bristle in male; parafacialia bare, at narrowest part ranging from less than one-half to more than one-half distance between vibrissae; face moderately to strongly receding; proboscis short, fleshy; cheeks usually broad, never less than one-fifth eye height; vibrissae situated on or usually above oral margin; palpi well-developed. Thorax with three or four dorsocentral and three sternopleural bristles; pteropleural bristle normal; apical scutellar bristles present; infrasquamal spinules absent. Abdomen black or brownish in ground color, pollinose, decidedly elongated in male, shorter and stouter in female; median marginal macrochaetae present on all segments, second segment never with more than four macrochaetae; discal macrochaetae absent in all except *dakotensis*; no ventral carina, male hypopygium prominent, anal forceps azygous; lobes of tenth sternite broad at base, each terminating in a small fingerlike process at each side of the hooklike anal forceps. Hind tibia irregularly ciliate, middle tibia with two or more strong bristles on outer front side, near middle; claws and pulvilli in male conspicuously long. Wings long, with the usual tachinid venation; first posterior cell open, ending considerably before apex of wing; bend of fourth vein destitute of a distinct appendage but frequently with a faint fold; last section of fifth vein less than one-half as long as the preceding; veins bare except base of third.

KEY TO SPECIES OF TACHINOMYIA

MALES

1. Abdomen without discal macrochaetae----- 2
 Abdomen with discal macrochaetae----- *dakotensis*, new species
2. Abdomen black; two reclinate upper frontal bristles----- 3
 Abdomen broadly red at sides, fourth segment wholly red except
 at base; three reclinate upper frontal bristles; parafacialia
 at narrowest less than one-half width of third antennal seg-
 ment (Florida)----- *floridensis* Townsend
3. Hind tibiae inwardly with long villosity (fig. 17, *g*), the villi
 often over twice the tibial width in length; lobes of fifth ster-
 nite, at base, with conspicuous flange----- 4
 Hind tibiae inwardly with short villosity, the villi scarcely the
 tibial width in length; lobes of fifth sternite without basal
 flange, their inner edges smooth or with a conspicuous elon-
 gated ridge----- 5

4. Each half of anal forceps (fig. 17, *a*) viewed in profile straight on posterior edge for six-sevenths of its length, then gently curving inwardly and abruptly tapering to terminus— *panaetius* (Walker)
Each half of anal forceps (fig. 17, *e*) viewed in profile straight on posterior edge for about one-half its length, then strongly curved inwardly and tapering to a fine point----- *apicata* Curran
5. Frontalia at middle of front about equal to or narrower than parafrontalia; hairs of cheeks predominantly pale; bristles of facial ridges often weak and depressed; face and front usually with a slight yellowish cast----- 6
Frontalia at middle of front at least as wide as parafrontalia; hairs of cheeks predominantly black, comparatively long; bristles of facial ridges strong and erect; face and front silvery; a comparatively black, thinly gray-pollinose, western species ----- *similis* (Williston)
6. Second genital segment orange-red----- 8
Second genital segment black, usually reddish below----- 7
7. Viewed from the side the anal forceps (fig. 17, *f*) strongly incurved, their posterior surfaces moderately to densely pilose and often obscured in outline----- *acosta*, new species
Viewed from the side the anal forceps (fig. 17, *b*) comparatively straight, tapering abruptly to terminus, their posterior surfaces moderately pilose and distinct in outline---- *nigricans*, new species
8. Parafacialia at narrowest part at least equal to if not wider than one-half distance between vibrissae; second antennal segment mostly reddish brown; lobes of fifth sternite usually smooth or with inconspicuous ridges on their inner edges— *cana*, new species
Parafacialia at narrowest part less than one-half distance between vibrissae; second antennal segment mostly black; lobes of fifth sternite usually with conspicuous ridges on their inner edges----- *variata* Curran

FEMALES

1. Abdomen without discal macrochaetae----- 2
Abdomen with discal macrochaetae----- *dakotensis*, new species
2. Posterior border of fourth segment fringed with long bristles of unequal length----- 3
Posterior border of fourth segment fringed with closely set, short bristles of nearly equal length; front wider than eye and widening slowly to base of antennae----- *apicata* Curran
3. Frontalia at middle of front narrower than parafrontalia, usually brownish; hairs of cheeks predominantly pale----- 4
Frontalia at middle of front at least as wide as parafrontalia, usually black; hairs of cheeks predominantly black, comparatively long; fourth abdominal segment black, mottled with gray-pollinose areas; face and front silvery pollinose without yellowish cast; western species----- *similis* (Williston)
4. Posterior preintraalar bristle well-developed; front widening slowly to base of antennae; cheeks about one-third the eye height; usually four dorsocentrals----- 5
Posterior preintraalar bristle absent or vestigial; usually three dorsocentrals----- 6

5. Front at vertex over one-third the head width; sides of front with a few scattered pale hairs----- *panaetius* (Walker)
 Front at vertex about or less than one-third the head width; sides of front with many fine hairs----- species near *panaetius* (Walker)
6. Front at vertex less than one-third the head width, with parallel margins; cheeks narrow, hardly one-fourth the eye height-- *variata* Curran
 Front at vertex over one-third the head width and widening slowly to base of antennae----- species near *variata* Curran

TACHINOMYIA PANAETIUS (Walker)

FIGURE 17, *a*

Tachina panaetius WALKER, List of the specimens of dipterous insects in the collection of the British Museum, pt. 4, p. 767, 1849.

Tachina pansa WALKER, *ibid.*, p. 787.

Tachina violenta WALKER, *ibid.*, p. 788.

Tachina irrequieta WALKER, *ibid.*, p. 789.

Tachinomyia robusta TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 96, 1892.

Townsend (1936, p. 281) considers *Tachinomyia robusta* a synonym of *Tachina panaetius* Walker. In 1929 Aldrich (1931, p. 13) studied Walker's types at the British Museum and formed the same conclusions. The type of *panaetius* is a single female from Nova Scotia. Since the females of *robusta* are not readily recognized from other closely allied species, this synonymy may be questioned. Aldrich also believed that *Tachina irrequieta* Walker, *T. pansa* Walker, and *T. violenta* Walker were likewise synonymous with *panaetius* Walker. The type of *irrequieta* is a female, and the same doubt exists as in the case of *panaetius*. The types of *pansa* and *violenta* are males, and although the genitalia have not been relaxed, it is believed that Aldrich was correct in his synonymy. Furthermore, a cotype specimen of *pansa* is in the United States National Museum collection and it is identical with *robusta* Townsend.

In an attempt to clear up this synonymy, specimens of the various species, with a key for their separation, was sent to Miss Aubertin at the British Museum. The results of this correspondence, while not entirely satisfactory, were in effect that the preceding synonymy was justified.

A cotype of *Tachinomyia robusta* Townsend, from Brookings, S. Dak. (Aldrich), is in the United States National Museum collection. It is a male and characterized as follows: Inner side of hind tibia with long villi; lobes of fifth sternite with distinct basal flange; fourth sternite convexly produced; second genital segment reddish black; anal forceps as figured (fig. 17, *a*); fourth abdominal segment black, mottled with thin grayish pollen; four dorsocentrals; posterior preintraalar bristle² present; second segment of antenna brownish, about

² The posterior preintraalar bristle equals the posterior sublateral bristle of Curran.

one-half the length of third; parafacialia at narrowest part compared with distance between vibrissae as 11.0 : 19.8 (average of six); cheeks one-third or more of eye height.

Thirty-five other males, with the essential characters of the cotype, show a slight variation. In all but two specimens, in which there were three on one side, there were four dorsocentrals; the posterior preintraalar bristle was usually strong but sometimes only a hair. Twenty-nine specimens had the second genital segment black, tinged with red above and wholly red beneath. In the others it was either wholly red or black above. Thirty-two flies had the second antennal segment reddish or reddish brown and in three it was black, tinged with red. Thirty-three had the facial ridges bristly for two-thirds their way and in two on the lowest third. Length, 10-16 mm.

Female.—Front at vertex 0.37 and 0.36 of the head width in two specimens; parafrontalia lightly golden pollinose, sparsely beset with pale hairs; inner and outer verticals developed; orbitals strong; frontals nine in number, strong; parafacialia silvery pollinose with slight golden cast, at narrowest part compared with distance between vibrissae as 9.5:18.5 (average of two); cheeks one-third of eye height; second antennal segment mostly black, about one-half length of third; thorax black, grayish pollinose with brownish tinge above, pleurae more grayish; four dorsocentrals; posterior preintraalar bristle present; abdomen black, intermediate segments grayish pollinose with trace of brown, particularly at apices; last segment wholly chalky white pollinose. Abdominal macrochaetae as follows: One fly has a median pair on the basisegment; otherwise the first and second segments each has one marginal pair; third with a marginal row; fourth with a row of discal or submarginal ones besides the marginal row of moderately long bristles of unequal length.

Remarks.—The foregoing description of the female of *panaetius* is from two specimens captured *in coitu* at Melrose Highlands, Mass., in May 1934. Other descriptions of the female of *Tachinomyia panaetius* have been given by Townsend (1915, p. 103) and Curran (1926, p. 169).

Material examined.—At the United States National Museum there are 62 males from various localities in the United States and Canada east of the Rocky Mountains. There do not appear to be any specimens from the Southern or Southwestern States. Six males and two females of the Melrose Highlands laboratory collection are from Massachusetts and New Jersey localities.

Hosts.—The writer has not seen any bred specimens that could be positively identified as *panaetius*. There are, however, in the

Melrose Highlands collection,³ females of species near *panaetius* bred by J. V. Schaffner, Jr., et al. from *Graptolitha antennata* Walker (G. M. L. 12161 T1); *Orthosia hibisci* Gueneé, form *insciens* Walker (G. M. L. 12164 R14); *Catocala* sp. (G. M. L. 11707 M3); noctuid (G. M. L. 11707 J8); *Acronycta betulae* Riley (G. M. L. 11707 M34).

TACHINOMYIA APICATA Curran

FIGURE 17, *e, g, h*

Tachinomyia apicata CURRAN, Trans. Roy. Soc. Canada, ser. 3, vol. 20, sect. 5, p. 171, fig. 16, 1926.

The species is readily recognized by the form of the anal forceps (fig. 17, *e*) and the conspicuous flange at the base of the fifth sternite (fig. 17, *h*). To these characters may be added the following: Last abdominal segment chalky white pollinose with narrow apical border of black, red, or reddish black; fourth sternite brownish, transversely flattened, not turned upward; second genital segment orange-red, rarely blackish; four dorsocentral bristles; posterior preintraalar bristle usually present, sometimes weak or wanting; first two segments of antenna, base of third, and apex of scutellum reddish; face and front silvery gray with yellowish cast of variable shades; parafacialia at narrowest part compared with distance between vibrissae as 10.8 : 20.5 (average of six); cheeks one-third of eye height; facial ridges bristly one-half to two-thirds way to antennae; frontals varying from 7 to 10; palpi gradually thickened toward tip; orbital hairs gray or yellowish gray. Length, 10–20 mm.

Female.—Essentially like male except more robust in form; last abdominal segment wholly chalky white-pollinose, posterior border fringed with closely set, short bristles of equal length; two pairs of orbital bristles and a wider front.

Material examined.—Sixty-nine males and 50 females in the Melrose Highlands laboratory collection taken during May and June from localities in Massachusetts and New Jersey. Also 7 males and 15 females in the United States National Museum from Ottawa, Canada, the District of Columbia, and the following States: New Hampshire, Massachusetts, Pennsylvania, Maryland, Indiana, and Missouri.

Host.—Unknown.

TACHINOMYIA FLORIDENSIS Townsend

Tachinomyia floridensis TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 97, 1892.

The species was described from one specimen, a male, from Florida (C. W. Johnson). Coquillett (1897, p. 82) included *floridensis* as

³ The Melrose Highlands collection of Tachinidae is now housed in the Forest Insect Laboratory of the Bureau of Entomology and Plant Quarantine at New Haven, Conn.

a synonym of *Masiphya brasiliiana* Brauer and Bergenstamm, which species he placed in *Biomyia*. Aldrich (1925, pp. 108-109), however, examined the type of *floridensis* and believed it to be "a distinct species strictly congeneric with the genotype *Tachinomyia robusta* Townsend."

The original description is brief and does not mention all the characters necessary for identification. The type has not been seen, but Aldrich's description (unpublished notes) verbatim follows:

"*Tachinomyia floridensis* Townsend.

One large male type with label as follows:

Florida

26

Jhnsn.

"16 mm. long. Parafacial at narrowest less than half the third antennal joint, or just about half (in *robusta* much more). Cheeks less than half the eye height. Acrostichal 3.3; dorsocentral 3.4; humeral 3; posthumeral 2; presutural 1; notopleural 2; supraalar 3 (front one small); intraalar 3; postalar 2; scutellar 3 lateral, 1 slender decussate slightly upturned apical, 1 discal (small); sternopleural 2.1; pteropleural small; postscutellum distinct.

"Abdomen largely red on sides, pollen not in perfect condition. First and second segments with one pair marginal, third segment with a row of eight, fourth segment with a stout row at last fourth and smaller on margin. First genital segment hardly visible but red; second segment red, hairy, the forceps darker, not spread; fourth sternite at edge with thin, upstanding, brownish margin, entirely different from that in *robusta*, and the inflexed tergites all with long hair, entirely different from *robusta* (I am comparing with type of *robusta*); fifth sternite about as in *robusta* but reddish. Legs black, all the tibiae villous on flexor side about as in *robusta*. A good species. (Kansas University, June 4, 1924).

"J. M. Aldrich."

Remarks.—The female of *floridensis* has been described by Townsend (1915, p. 103), but the writer is unable to recognize the species from the description given.

TACHINOMYIA SIMILIS (Williston)

FIGURE 17, c

Prospheerysa similis WILLISTON, North American Fauna, No. 7, p. 256, 1893.
Tachinomyia occidentalis CURRAN, Trans. Roy. Soc. Canada, ser. 3, vol. 20, sect. 5, p. 170, fig. 17, 1926.

Coquillett (1897, p. 119) places *similis* Williston as a synonym of *robusta* Townsend, but Aldrich (unpublished MS.) gave it specific status. According to him, and as verified by the writer, Curran's *occidentalis* is a synonym.

The following brief description is from a cotype, Sonoma County, Calif., now in the United States National Museum collection:

Male.—Front and face silvery gray pollinose without trace of yellow; fourth abdominal segment mostly black, mottled gray pollinose; cheeks nearly one-half of eye height, clothed with comparatively long hairs which are predominantly black; hind tibia with short villosity on inner side; frontalia wider than either parafrontal; bristles of facial ridges strong, reaching two-thirds way to antennae; lobes of fifth sternite reddish, without basal flange but with slight ridges; apex of fourth sternite convexly produced; three dorsocentral bristles; no posterior preintraalar bristle; anal forceps (fig. 17, *c*) somewhat as in *nigricans*; second genital segment orange-red; second antennal segment black.

Forty-one other males in the United States National Museum collection agree well with the cotype. There are usually three dorsocentral bristles although occasionally four are present; posterior preintraalar bristle absent in all but two specimens, in which case it is vestigial; facial ridges bristly two-thirds way to antennae, rarely less; vibrissae well above oral margin; scutellum wholly black, frequently with reddish apex; face and front silvery gray pollinose without trace of yellow; usually three strong bristles on anterior dorsal side of middle tibia.

Female.—Essentially like male except for the usual sexual differences.

Variations.—Twenty-one males and 27 females bred by the writer from *Stilpnotia salicis* Linnaeus, collected at Puyallup, Wash., in 1935, show the following variations: Three or four dorsocentrals, usually the latter, although very frequently the second from the suture is either weak or hairlike. When three bristles are present they are often irregularly spaced. Posterior preintraalar bristle absent in 39 and vestigial in 9. Second genital segment of male orange-red in all but two specimens, in which case it is obscurely so. Abdomen wholly black, gray pollinose or frequently, in the male, with sides of second segment reddish yellow; second antennal segment black. Face and front silvery gray pollinose in all specimens. Length, 12-13 mm.

Material examined.—About 90 specimens at the United States National Museum from localities in California, Washington, Idaho, Oregon, Colorado, and Arizona.

Hosts.—*Clisiocampa thoracia* Stretch; *Hemerocampa vetusta* Boisduval; *Stilpnotia salicis* Linnaeus; *Halisdota argentata* Packard.

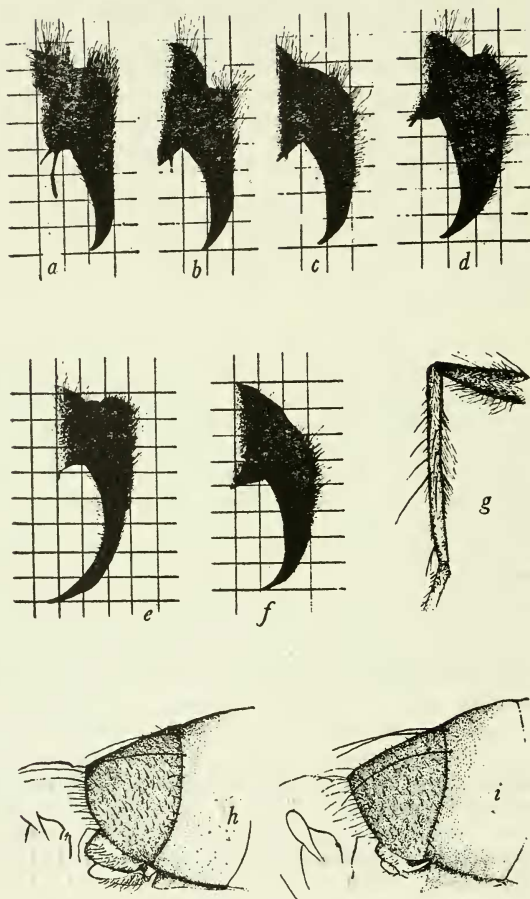


FIGURE 17.—TACHINOMYIA CHARACTERS

a-f, Lateral aspect of anal forceps of male genitalia: a, *T. panaetius* (Walker); b, *T. nigricans*, new species; c, *T. similis* (Williston); d, *T. variata* Curran; e, *T. apicata* Curran; f, *T. acosta*, new species.

g, Hind tibia of *T. apicata* viewed from behind.

h, i, Apex of abdomen with drawn genitalia showing formation of fourth and fifth sternites in lateroventral aspect: h, *T. apicata*; i, *T. variata*.

TACHINOMYIA VARIATA Curran

FIGURE 17, *d, i*

Tachinomyia variata CURRAN, Trans. Roy. Soc. Canada, ser. 3, vol. 5, sect. 5, p. 169, figs. 14, 15, 1926.

According to Curran (1926, p. 168) *variata* is characterized principally by the dense, bristly pile on the lower surface of the anal forceps, three or four dorsocentral bristles, and absence of ridges on the lobes of the fifth sternite.

In his description Curran omitted several characters which would have aided materially in the identification of the species. At the request of the writer more details concerning the type specimen have been furnished by G. H. Shewell, of the Canadian National Museum, where the type is deposited. His description is as follows:

"Length, 12 mm. Four posterior dorsocentrals, the second very fine; fourth abdominal segment black with reddish posterior border, thinly gray pollinose; fifth sternite lobes reddish with distinct ridges on their inner edge; second genital segment reddish; inner forceps pilose behind (about as in Curran's drawing); ratio of second to third antennal segment 1 : 2.5."

Tachinomyia variata differs slightly from *T. cana* as follows: The ridges on the inner edges of the lobes of the fifth sternite are better developed and apparently more constant in character; the second antennal segment is mostly black; the parafacialia are narrower; the anal forceps are somewhat stouter and usually more densely pilose on their posterior surfaces; and there are usually three dorsocentrals.

Redescription of male.—Hind tibiae inwardly with short villosity, villi scarcely the tibial width in length; inner edges of lobes of fifth sternite usually with a conspicuous ridge (fig. 17, *i*); anal forceps (fig. 17, *d*) with dense pilosity behind, stout at base and somewhat similar in outline to *acosta*; fourth sternite convexly produced; fourth abdominal segment black, moderately gray pollinose, with reddish-black apical border; first genital segment reddish black, second orange red, moderately pilose above; scutellum black, apex slightly reddish; three or four dorsocentrals; no posterior preintraalar bristle; cheeks hardly one-third the eye height, with pale hairs; second antennal segment mostly black, third segment scarcely three times its length. Front silvery gray pollinose, with slight yellowish cast, at narrowest part about one-fifth the head width; 10 or 11 frontal bristles, the last 2 reclinate; frontalia narrow, widening gradually to base of antennae; parafacialia nearly concolorous with front, at narrowest part compared with distance between vibrissae 7.6:17.5 (average of six); facial ridges bristly one-half way to antennae; vibrissae well above oral margin. Length 12–17 mm.

Female.—Essentially as in male. Front at vertex less than one-third of head width, with parallel margins; two pairs of orbital bristles; second antennal segment black, third about two and one-half times its length; cheeks narrow, less than one-fourth the eye height; palpi slender; four dorsocentrals, the second from suture weak; no posterior preintraalar bristle; middle tibia with three anterior dorsal bristles, the uppermost one shortest; hind tarsi slender; fourth abdominal segment black, thin gray pollinose, the posterior border fringed with moderately long bristles. Length 12 mm.

Material examined.—In the United States National Museum collection there are four paratypes, including both sexes, from Ontario, Quebec, and Alberta, Canada. There are also six males and one female from New Brunswick, Canada, and from the following States: New Jersey, Wisconsin, South Dakota, and Colorado. Also there are three specimens in the David G. Hall collection from Ohio, Kansas, and New Mexico.

The material representative of this species in the Melrose Highlands laboratory collection consists of 10 specimens collected at Lunenburg, Mass., from May 21 to June 29, 1914; 3 specimens collected at Melrose, Mass., June 1917, May 7, 1930, and May 26, 1934; 4 specimens bearing "G. M. L." numbers 9427d¹, 9427a¹, 9427a², and 9427b¹, which were bred from *Porthetria dispar*, collected in Massachusetts, July 1925. These flies emerged in June 1926 and were used in a successful reproduction experiment by T. H. Jones. No. 9427d¹ is the progeny of Nos. 9427a² (♂) and 9427b¹ (♀). There are also two other specimens from Morris County, N. J., collected May 19, 1936. Specimens of this material were submitted to Mr. Shewell for comparison with the type of *variata*, and according to him the anal forceps agree with those of *variata* in general outline, though they are smaller and more densely pilose behind.

Hosts.—*Nephelodes emmedonia* Cramer (W. A. Squires, Sackville, New Brunswick, Canada, June 2, 1929); *Porthetria dispar* Linnaeus (as preceding).

TACHINOMYIA CANA, new species

This species resembles *variata* but differs in having broader parafacialia, a brownish second antennal segment, and slenderer anal forceps.

Male.—Hind tibiae inwardly with short villosity, the villi scarcely the tibial width in length; lobes of fifth sternite orange-red, smooth at base and inconspicuously ridged on their inner edges; fourth sternite convexly produced; fourth abdominal segment mostly chalky white, with narrow apical border of orange-red: dorsum of scutellum broadly reddish at apex; first and second genital segments orange-

red; first, second, and base of third antennal segment brown or reddish brown. Anal forceps long; each half, viewed in profile, straight on posterior edge for two-thirds its length, hence strongly forwardly curved; viewed from behind, slender and moderately pilose; four dorsocentrals; no posterior preintraalar bristles; thorax black, gray pollinose with brownish tinge; front silvery gray pollinose with definite yellowish cast, at narrowest part about one-fourth the head width; parafacialia concolorous with front, at narrowest part compared with distance between vibrissae 10:19.6 (average of six); cheeks nearly one-third the eye height; facial ridges strongly bristly over halfway to antennae; third segment of antenna less than three times the second. Length, 14 mm.

Female.—Unknown.

Type.—Male, U. S. N. M. No. 53387.

Remarks.—The holotype is from Melrose Highlands, Mass., collected by the writer on May 24, 1932. The two paratypes are both males from the same locality as the type collected on May 21, 1932. Other material, in the Melrose Highlands laboratory collection, consists of 25 collected specimens from about the same locality as the type. Twenty-one of these have four dorsocentral bristles, one has three, and the remaining three have three on one side and four on the other; lobes of the fifth sternite smooth in five specimens and inconspicuously ridged in the rest; fourth sternite convexly produced; first two segments of antenna, and usually the base of the third, brown or reddish brown; second genital segment orange-red, posterior border of fourth abdominal segment orange-red in all but two specimens, in which it is mostly black; scutellum black, thinly gray pollinose, broadly reddish at apex. Length variable, 11–16 mm. Besides the above there are three specimens of this species in the David G. Hall collection from Kansas and Arkansas.

TACHINOMYIA ACOSTA, new species

FIGURE 17, f

In *acosta* the anal forceps are slenderer than in *variata*. The species also differs in having the first and second genital segments as well as the fifth sternite black and in characters of lesser importance.

Mole.—Hind tibiae inwardly with short villosity, the villi scarcely the tibial width in length; lobes of fifth sternite black and without basal flange, their inner edges smooth or at most with low, inconspicuous ridges; fourth sternite black, convexly produced; fourth abdominal segment not densely gray pollinose but at most moderately gray pollinose with black apical border; scutellum black, faintly reddish apically; first and second genital segments black, the latter faintly

reddish beneath; second antennal segment mostly black, a little less than one-third length of third segment; anal forceps (fig. 17, *f*) strongly incurved, their posterior surfaces moderately pilose; four dorsocentral bristles; no posterior preintraalar bristle; front and upper part of face yellowish pollinose, paler below; parafacialia at narrowest part compared with distance between vibrissae 7.6 : 18.6 (average of six); cheeks about one-fourth of eye height, with a predominance of pale hairs; facial ridges bristly about one-third way to antennae, the uppermost ones very weak; vibrissae slightly above oral margin. Length 13 mm.

Female.—Doubtfully known.

Type.—Male, U. S. N. M. No. 53388.

Remarks.—The holotype is from Morris County, N. J., collected by the writer on May 10, 1936. The two paratypes are both males, from Reading Mass., May 26, 1916 (R. T. Webber), and Wellesley, Mass., June 1, 1909 (J. D. Tothill), respectively.

In 40 other males identified as *acosta* the lobes of the fifth sternite are smooth in 19, nearly so in 11, and slightly ridged in 10. All but one of them have four dorsocentrals. In only one instance is the posterior preintraalar bristle present. The fourth sternite is turned upward from the abdomen in all but eight, in which case it is flattened. Usually the fourth abdominal segment is black, moderately pollinose but occasionally thinly pollinose and indefinitely marked; posterior border of segment black. Second antennal segment usually black, in 3 specimens slightly reddish, scutellum wholly black in 16, slightly reddish at apex in 22, and black, conspicuously marked with yellow, in 2; second genital segment always black, sometimes reddish beneath, densely pilose above. The pilosity on the hind surface of the anal forceps is dense in 23 specimens and but moderately so in 17. The front and upper part of the face are pale yellow pollinose, in no instance distinctly golden. In some specimens the lower part of the face is silvery either with or without a pale yellowish cast. Length 10–17 mm.

Hosts.—*Graptolitha disposita* Morrison (G. M. L. 11705 J7); *G. innominata* Smith (G. M. L. 11705 M8); *G. antennata* Walker (G. M. L. 12161 J9); *Graptolitha* sp. (G. M. L. 11705 N2). All recorded at the Melrose Highlands laboratory by J. V. Schaffner, Jr., et al.

Material examined.—About 45 males, from Massachusetts and New Jersey localities, contained in the collection of the Melrose Highlands laboratory.

TACHINOMYIA NIGRICANS, new species

FIGURE 17, *b*

Resembles *acosta* but differs from that species in the structure of the anal forceps and their lack of dense pilosity.

Male.—Hind tibiae inwardly with short villosity, the villi scarcely the tibial width in length; lobes of fifth sternite black, without basal flange, their inner edges smooth or at most with low, inconspicuous ridges; fourth sternite convexly produced; fourth abdominal segment not densely gray pollinose but mostly black, mottled with thin grayish pollen, apical border shining black; scutellum black, thinly gray pollinose; second genital segment black above, reddish beneath; second antennal segment black with brownish apex; third segment hardly twice its length; anal forceps (fig. 17, *b*) moderately pilose behind, nearly straight, tapering abruptly to terminus; four dorso-central bristles; no posterior preintraalar bristle; front and face silvery gray pollinose, with yellowish cast; parafacialia at narrowest part compared with distance between vibrissae 7.1:18.6 (average of six); cheeks about one-fourth of eye height, with pale hairs; facial ridges bristly about halfway to antennae; vibrissae slightly above oral margin. Length, 11–16 mm.

Female.—Doubtfully known.

Type.—Male, U.S.N.M. No. 53389.

Remarks.—The holotype is from Lunenburg, Mass., collected by H. W. Allen during 1916. The two paratypes are from Wellesley, Mass. (J. D. Tothill, June 1, 1909), and Morris County, N. J. (R. T. Webber, May 10, 1936). Other material, in the Melrose Highlands laboratory collection, consists of 60 males from localities in Massachusetts, some of which are bred specimens. All agree well with the type, particularly as regards the structure of the anal forceps; the lobes of the fifth sternite are black, practically smooth, or each bears an inconspicuous ridge; the anal forceps are moderately pilose behind, rarely more so. There is some variation in the number of dorsocentrals, 8 out of 60 males having 3 instead of the normal 4. Of all the specimens examined none had a posterior preintraalar bristle; the genital segments are black above, usually reddish beneath; the scutellum and second antennal segment are mostly black. Usually there are 11 or 12 frontal bristles, rarely less; the face and front are silvery gray pollinose with yellowish cast in all but two specimens, in which they are silvery.

Another lot of males from Massachusetts localities number slightly over 100 specimens. All have the vibrissae on or slightly above the oral margin; the first and second genital segments are entirely black, or black above and reddish beneath; normally there are four dorso-

central bristles; the second segment of the antenna and the scutellum are black in most part. Length, 6–12 mm.

Placed provisionally with this species is a series of approximately 200 flies bred at the Melrose Highlands laboratory from *Alsophila pometaria* Harris and other species of Geometridae. All these flies are much smaller in size than the type but there does not appear to be any other appreciable difference. Length, 6–10 mm.

In the United States National Museum there are specimens from New Jersey, 1924; J. F. King; Hartford, Conn., May 9, 1916, I. N. Gabrielson; ex *Alsophila pometaria*, Quaintance No. 16610, Wallingford, Conn., May 1, 1920, B. A. Porter; Browns Mills, N. J., July 9, 1926, H. G. Hallock. Also there are one male from Minot, N. Dak., June 18, 1918; one male from Lafayette, N. Dak., May 25, 1916; and one female from Big Stone City, S. Dak., June 8, 1918, Aldrich.

Hosts.—*Catocala micronympha* form *fratercula* Grote and Robinson (G. M. L. 11707 L4); *Graptolitha antennata* Walker (G. M. L. 12161 E14); *Porthetria dispar* Linnaeus (G. M. L. 9427); *Alsophila pometaria* Harris (G. M. L. 10076 and sub-nos.); *Phigalia titea* Cramer (G. M. L. 10007 C); *Physostegania pustularia* Gueneé (G. M. L. 10016 B); *Erannis tiliaria* Harris (G. M. L. 10018 S3). All recorded at the Melrose Highlands laboratory by J. V. Schaffner, Jr., et al.

TACHINOMYIA DAKOTENSIS, new species

This species comes nearest to *nigricans*, particularly to the small forms reared from *Alsophila pometaria* Harris, from which it differs in having discal abdominal bristles, brownish legs, and more broadly curved anal forceps.

Male.—Hind tibiae inwardly with short villosity, the villi scarcely the tibial width in length; lobes of fifth sternite yellowish brown, without basal flange, their inner edges smooth; fourth sternite convexly produced; thorax and abdomen black, thinly gray pollinose with strong brownish cast; fourth segment not densely gray pollinose but mostly mottled with thin grayish pollen, the posterior border black, faintly brownish at sides; second antennal segment and most of scutellum brown; genital segments orange-red; anal forceps sparsely pilose behind, their apices strongly curved forward as in *acosta*; three dorsocentrals; facial ridges weakly bristled; vibrissae at or but slightly above oral margin; third antennal segment three times the length of second; parafacialia at narrowest part compared with distance between vibrissae 5.3:14.6 (average of six); cheeks one-fifth the eye height, with pale hairs; face and front concolorous, silvery gray pollinose with faint yellowish cast; third segment of abdomen with one pair of discal bristles; legs brownish black. Length, 9 mm.

Female.—Essentially as in the male, except for the usual sexual differences.

Type.—Male, U. S. N. M. No. 53390.

Remarks.—Described from 14 specimens. The holotype is from Big Stone City, S. Dak., collected on June 8, 1908 (Aldrich), and the allotype from Lake Metigoske, Turtle Mountains, N. Dak., June 20, 1918 (Aldrich). The paratypes are as follows: Two males, Lake Metigoske, Turtle Mountains, N. Dak., June 20; one female, Mandan, N. Dak., June 16; one female, Bottineau, N. Dak., June 20; one female, Minot, N. Dak., June 18; two males, Wanbay, S. Dak., June 6; one male, Turtle Mountains, near Bottineau, June 21 (all specimens collected by Aldrich in 1918); two males and one female, Algonquin, Ill. (Nason); one male, Oxbow, Saskatchewan, June 17, 1907 (Knab).

The paratypes agree well with the type, all having brownish legs, orange-red genitalia, three dorsocentral bristles, and weakly ciliated facial ridges. All but three have well-developed discal abdominal macrochaetae, and the scutellum is mostly brownish in all but two cases, in which black predominates.

Material examined.—Besides the above there are specimens in the United States National Museum from Idaho, Washington, and Manitoba, Canada; also a specimen from Kansas in the David G. Hall collection.

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